



THE CITY OF SAN DIEGO

City of San Diego
Planning & Development Review
Building Development Review
1222 First Avenue • MS-401
San Diego, CA 92101
(619) 446-5400

Building Newsletter 17-3

Special Inspection Requirements for Structural Welding

Interpretations of State and Local Building Codes
1998 California Building Code: Chapter 17
Revision Date: January 1999

Page 1 of 2

Reference, Building Code Sections 1701, 1701.5(5), 1701.6, 1701.7, 1703

I. General Requirements

The Building Code, Section 1701.5(5), requires that all structural welding, including welding of reinforcing steel and special moment resisting steel frames, be continuously inspected by a certified special inspector.

A. Structural Welds:

Structural welds are defined as welding of any member or connection which is designed to resist loads and forces required by the Building Code. All structural welds are required to be continuously inspected by a special inspector certified by the office of Field Inspection Services.

Exceptions:

1. Welding performed in the shop of a fabricator approved by the City of San Diego, Field Inspection Services. See Building Newsletter 17-6 "Off-Site Fabrication of Building Components" for additional information and requirements.
2. Periodic Inspections:
The special Inspector need not be continuously present during welding of the following items, provided the materials, qualifications of welding procedures and welders are verified prior to the start of work; periodic inspections are made of work in progress; and a visual inspection of all welds is made prior to completion or prior to shipment of shop welding:
 - 2.1 Single-pass fillet welds not exceeding 5/16 inch (7.9 mm) in size.
 - 2.2 Floor and roof deck welding.
 - 2.3 Welded studs when used for structural diaphragm or composite systems.
 - 2.4 Welded sheet steel for cold-formed steel framing members such as studs and joists.
 - 2.5 Welding of stair and railing systems.

B. Special Moment-Resisting Steel Frames:

Continuous special inspection is required during the welding of special moment-resisting steel frames. In addition to Item A requirements above, nondestructive testing is required by the Building Code Section 1703. See also Section VI below.

C. Welding Of Reinforcing Steel:

Continuous special inspection is required during the welding of reinforcing steel.

Exceptions:

1. The special inspector need not be continuously present during the welding of ASTM A 706 reinforcing steel not larger than No. 5 bars used for

embedments, provided the materials, qualification of welding procedures and welders are verified prior to the start of work; periodic inspections are made of work in progress; a visual inspection of all welds is made prior to completion or prior to shipment of shop welding.

D. Minor Welds:

The Building Official may waive the requirements for special inspection for structural welds that are considered to be of a minor nature *if so specified on the plans by the designer*. These include, but are not necessarily limited to, the following:

1. Metal framing connectors intended for wood-to-wood or wood-to-concrete connections provided they are stamped or otherwise identified by the manufacturer in accordance with a current ICBO Research Evaluation Report or other recognized listing agency.
2. Steel storage racks and/or shelving not over 8 feet in height.
3. Trellises not over 12 feet in height above finish grade.
4. Signs not over 8 feet in height above finish grade and/or signs smaller than 50 sq. ft. of surface area.
5. Supports for equipment weighing less than 400 pounds.
6. "Hold-together" connections such as a steel column-to-baseplate or steel column-to-column cap where the column supports vertical loads only and is not part of any lateral load-resisting system.

II. Continuous Special Inspection

Continuous special inspection means that the special inspector is on the site at all times observing the work requiring special inspection.

- A. The plans shall clearly identify the welds that require continuous special inspection. Refer to Building Newsletter 17-1, "Special Inspection and Structural Observation Requirements on Plans" for guidelines on how to provide this information in an acceptable manner.
- B. It is the responsibility of the contractor and/or fabricator to schedule for special inspection and arrange for the special inspector presence for performance of any work requiring inspection.
- C. Special inspections must be performed by special inspectors certified by the Field Inspection Services Division of the City of San Diego, Planning and Development Review Department. A list of approved construction materials testing laboratories and special inspection agencies is available upon request

from Inspection Services.

D. Prior to the start of work the special inspector shall:

1. Check the qualifications of the welder(s). Welders must be A.W.S. certified welders.
2. Verify that the welding procedures are applicable to the work and have been qualified or are prequalified.
3. Verify that the materials to be welded in the fabricator's shop or field comply with those specified on the approved plans or fabrication drawings as accepted by the designer of record.
4. Verify that fabricator's shop is a shop approved by the Field Inspection Services to fabricate building components.

E. The special inspector shall continuously observe the welding process while it is being performed.

III. Periodic Special Inspection

Some inspections may be made on a periodic basis and satisfy the requirements of continuous inspection, provided this periodic scheduled inspection is performed as outlined in the project plans and approved by the building official.

Periodic special inspections will be permitted under the following conditions:

- A. The plans must outline the designer's requirements and schedule for periodic special inspection.
- B. The plans shall identify all welds that are to have periodic special inspection, otherwise continuous special inspection is presumed to be required.
- C. The building official must approve all requests to provide periodic special inspection prior to commencing work.
- D. Prior to the start of the work the special inspector shall verify items noted above in section II, D-1 thru D-4. Prior to completion of the welding, while the welders and the welding equipment are still on the job, the special inspector shall make a final visual inspection of all welds for compliance.

IV. Shop Fabrication

Shop fabrication of building components shall be either performed in a fabricator's shop registered and approved by the City of San Diego Inspection Services or under continuous observation by a certified special inspector. For further information refer to Building Newsletter 17-6.

V. Certification Of Compliance

- A. When components are shop fabricated, the fabricator shall issue a City of San Diego "Certificate of Compliance Form" stating that the fabricated components comply with the approved plans, specifications and applicable regulations.

This certificate shall be submitted to the building inspector or Field Inspection Services and the architect or engineer of record prior to shipment and/or erection of

the fabricated components. A copy of the form may be picked up at the Field Inspection Services office or may be requested by phone.

- B. When welding is done in the presence of a special inspector, he/she shall submit a signed report stating that the work requiring special inspection was, to the best of the inspector's knowledge, done in conformance with the approved plans or designer accepted fabrication drawings, and the applicable sections of the Building Code, as adopted by the city of San Diego.

- C. The contractor shall be responsible for providing all information and access needed by the special inspector to perform the necessary inspections.

VI. Nondestructive Testing

In addition to the special inspections required by the Building Code and this Newsletter during the welding, welded, fully restrained connections between the primary members of ordinary moment frames and special moment-resisting frames shall be tested by nondestructive methods for compliance with approved standards and job specifications per Building Code Section 1703.

- A. The plans shall identify all primary members and connections that require such testing. A program for this testing shall be provided on the plans by the person responsible for the structural design.
- B. Nondestructive testing of any structural weld may also be required under any of the following conditions:
 1. When specified on the plans by the designer.
 2. When unacceptable welds or flaws are observed.
 3. When the special inspector or the building official questions the origin or quality of the fabricated components being installed.
 4. When the required special inspection was not performed.
 5. When components were fabricated in a shop not approved by the Field Inspection Services.
- C. All nondestructive testing shall be performed by a construction materials testing laboratory or agency approved by the Field Inspection Services at no expense to this jurisdiction. A list of approved construction materials testing laboratories and special inspection agencies is available upon request from Inspection Services.
- D. Testing methods and procedures as noted in item (B) above shall be submitted by the engineer or architect of record to the office of Field Inspection Services for review and approval prior to commencement of testing.

VII. Other Information

For questions regarding special inspections, structural observation, materials testing and off-site fabrication you may contact Inspection Services at (858) 492-5070.